Network Centric Warfare: Leveraging Technology – Challenging the Command and Control Paradigm

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The modern world is experiencing a revolution that has drawn its inhabitants into the Information Age. This is an era in which information systems and concepts are shaping the way that people think, act, and live. By employing Information Age technologies, limits to the speed of basic processes and functions are no longer constrained by time or space. Furthermore, near real-time communication between organizations is feasible, regardless of their geographic location, through networking (Long, 2000). Commercial organizations have lead the way in adopting and integrating Information Age concepts and technologies to achieve optimal levels of success and operational performance. Now, the military is seeking to exploit the same technological advances in networking to achieve similar results on the twenty-first century battlefield.

Though a new concept that has only recently been introduced to the joint military community, the Marine Corps is pursuing the Network-Centric Warfare (NCW) concept. The NCW concept is a prospective warfighting paradigm that promises to contribute to achieving optimal command and control (C2) on the future battlefield by exploiting information technology. The greatest challenge lies not in leveraging this technology and integrating it with operational capabilities, but in convincing Marines to adopt a new C2 paradigm that may challenge the Marine Corps' current way of thinking. If the Marine Corps seeks to enjoy the

potential benefits offered by NCW and achieve success on future battlefields, then Marine leaders must open their minds to understanding, leveraging, and implementing Information Age technology.

Understanding NCW:

What is Network-Centric Warfare?

The principles of network-centric enterprising were first introduced to the military in *JV2010* (1996), a joint publication that outlined the characteristics of future warfare. In *JV2010*, the founders of this enterprise express the belief that principles employed by network-centric enterprises, which allow them to leverage technology to achieve a competitive advantage, can be translated into operational doctrine for future military forces. Consequently, the new conceptual warfighting paradigm, NCW, was born. Now, the term NCW is used to describe the way future forces will be trained, organized, and equipped to fight. In Alberts, Garstka, and Stein's *Network Centric Warfare* (1999), the gospel for this new concept, NCW is described as:

> …An information superiority-enabled concept of operations that generates increased combat power by networking sensors, decision makers, and shooters to achieve shared awareness, increased speed of command, higher tempo of operations, greater lethality, increased survivability, and a degree of self-synchronization. (p. 2)

In short, the idea of employing NCW concepts enables a military force to translate information superiority into combat power by establishing a robust network that links all knowledgeable entities in the battlespace.

NCW is not strictly a technology-based concept of operations. It is an evolving military response to how to manage human and organizational behavior effectively in the Information Age. In describing the nature of NCW, Admiral Cebrowski, the former Deputy Chief of Naval Operations and "father" of the NCW concept asserts, "This is not about technology. It's about how you use it" (1997, p.4). Thus, NCW is not focused on the ability of information technology or network capability, but on what the network does – enabling the rapid, real-time exchange of information so that empowered decision makers can make better, more informed decisions during the complex act of warfighting.

The fullest implementation of NCW by integrating battlefield systems through a common information network results in at least three significant advantages: the networking of long range sensors and weapons for simultaneous massing of fires on enemy targets; geographic dispersal allowed by long-range, wireless communication networks resulting in greater force protection; and tremendous increases in operational tempo, including the decision making process (FitzSimmonds, 1998).

Therefore, the desired effects achieved by this concept include an escalation in responsiveness due to increased operational tempo, lower risks in execution due to enhanced battlespace awareness, and overall increased combat effectiveness (Alberts et al., 1999).

Leveraging NCW:

Potential Power, Benefits, and Implications of NCW

NCW focuses on the potential benefit of linking command, control, sensory, and engagement capabilities of all battlefield entities through a digital data network providing a common operational picture that allows these entities to work together to achieve synergistic effects. The source of the increased power of a network-centric organization is derived from the increased real-time information flow between the nodes in the network or battlespace entities (i.e., sensors and shooters), which enables shared battlespace awareness with increased quality. When shared battlespace awareness is exploited by linking C2 and other actor entities, it enables cooperative and synchronized force execution (Alberts et al., 1999), resulting in increased operational tempo. The potential power of a NCW force will be found in its tightly coupled network of battlespace decision makers. Therein lies the impending problem with melding NCW with Marine Corps doctrine, for the idea of a

"tightly-coupled" network may alarm leaders at the tactical decision making level.

Many skeptics of NCW believe that linking all battlefield entities is a method of pooling and controlling decisions at one central decision-node, which will cause NCW implementation to result in greater centralized control (FitzSimmonds, 1998). Whether due to paranoia caused by personal experience or wisdom gained through historical reference, critics have reason to fear a NCW paradigm that is improperly employed. The increasing capability of data communication networks to link multiple battlespace entities does escalate the potential for centralized control. For this reason, many fear that employing wireless C2 networks will enable a centralized philosophy of command where battlespace information is passed to a central node for final decision making or for decision approval authority (FitzSimmonds, 1998); an ineffective and undesirable intention that is contrary to the current Marine Corps model for warfighting (i.e., Maneuver Warfare).

On the contrary, the true power of NCW is derived from the ability to empower all entities in the battlespace as decentralized decision makers (Alberts et al., 1999; Cebrowski, 1997; FitzSimmonds, 1998). In a NCW environment, once warfighters are riddled by the chaotic effects of war (fog, friction, complexity, uncertainty, etc.), the prudent senior

decision maker will becoming more inclined to use the network

for its intended purpose to achieve and maintain high

operational tempo; by pushing down decisions to key decision

makers at lower echelons. Indeed, the principal objective of

NCW is the empowerment of all battlefield entities to decide and

act simultaneously in order to mass effects, achieve shock and

awe, and bring about a rapid conclusion to the engagement

(Alberts et al., 1999; Ullman & Wade, 1996).

Implementing NCW:

Challenging the Command and Control Paradigm

According to *MCDP-1 Warfighting* (1997), the Marine Corps'

core doctrinal publication, the nature of warfare has and always

will be a chaotic, challenging task environment mired in the fog

and friction of war. The fog of war is the uncertainty about

what is going on during military operations, while friction is

the difficulty experienced in translating the commander's intent

into task performance. Fog results from a lack of battlespace

awareness due to an inability to develop a coherent battlefield

picture of what is actually happening. Friction is a result of

the inability to communicate or receive instructions based upon

an insufficient distribution of battlespace awareness.

Exploiting advances in the Information Age will help military

forces reduce the fog and friction of war, or at least operate

more effectively within it. Future forces will have the ability to share real-time knowledge in order to develop an effective common picture of friendly, enemy, and neutral forces on the battlefield to shape and form responses (Alberts et al., 1999).

The hierarchical command and control structure currently used by the military was instituted to accommodate the fog and friction of war by providing a span of control over a limited number of entities. Intermediate-level leaders were placed between senior military leaders and the junior leaders at the tactical level in order to exercise an effective span of control over military operations. However, these extra layers of control are often an impediment to timely information flow and expedient decision making. Thus, the current speed of information flow utilizing the hierarchical organizational paradigm is inadequate for the Information Age (Alberts et al., 1999).

If an organization desires to develop competitive advantage through achieving information superiority, it must become more horizontal. For military organizations, a flatter command and control structure with an increased span of control can be established with an extensive data communication network that links senior headquarters to combat sensors, weapons, and warfighters. Eliminating the necessity for middle-levels of command makes the once pyramid-shaped command structure a

flattened, mesh command structure, which eases the flow of information and corresponding decisions between seniors and battlefield decision makers. However, commanders must be careful that the change in command structure does not require only centralized coordination for the subordinate operator-nodes, but instead creates a network of entities within a command that share battlespace knowledge equally. Given adequate training, each entity will have the ability to make command decisions that affect the battle based upon their firsthand knowledge of the situation and the key information provided through the network (FitzSimmonds, 1998).

Challenge and Summary

Yet, NCW is unproven; it is still a concept. It is a future warfighting paradigm framed by organizational, leadership, and technology theory. Network enterprising is a concept proven in the civilian marketplace with great success. Nevertheless, in order to remain an elite military fighting force for a global superpower in the emerging Information Era, the Marine Corps must embrace NCW to maintain its status of warfighting superiority. Helping NCW materialize from an idea to a valid operational doctrine will require substantial changes in the Marine Corps' way of thinking. The culture, C2

structure, concepts of operation, and organizational forms within the Marine Corps will need to be revisited.

NCW is **not** a technology-laden Maneuver Warfare; it is its own separate and distinct warfighting model. To reach its fullest potential, NCW will need to be deeply rooted into the Marine Corps' operational art, meaning that new technologies cannot simply be applied to current equipment, doctrine, tactics, and organizations of warfare. There will need to be a co-evolution of organization, doctrine, and technology in the warfighting "ecosystem" to ensure its success. This will lead to the emergence of new tactics, techniques, and procedures to conduct network-centric operations (Alberts et al., 1999).

Because NCW is a warfighting paradigm that encompasses both the leadership and management aspects of warfighting, the Marine Corps must ensure that every Marine throughout the organization understands the tenets of NCW, just as each currently understands Maneuver Warfare. Of course leadership principles that encourage initiative and sound decision making should continue to be taught and encouraged during the earliest stages of Marine training, both during Recruit Training and Officer's Candidate School, to preserve their continuance within the Marine Corps' professional and warfighting ethos. Additionally, the Marine Corps must take an extra step in ensuring that the power of the network is realized by all of its participants by

teaching the NCW strategy at respective follow-on, specialty, and professional military education (PME) schools (e.g., Non- and Staff Non-Commissioned Officer Academies, Expeditionary Warfare School, Command and Staff College, and the Marine Corps War College). Since NCW is the way of the future, its principles must be taught to all who will lead the Marine Corps in the future.

The fullest implementation of the NCW paradigm will result in significant advances in establishing information superiority, increasing battlespace awareness, and achieving increased operational tempo that have never been experienced before. The Marine Corps' progress towards the NCW transformation will be challenging, yet practicable. However, first the Marine Corps must dare to open its collective mind and seek to understand, leverage, and implement Information Age technology on future battlefields even if it is at the expense of its *currently* successful warfighting doctrine.

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